

reaches 488 meters at Colima and, at no great elevation, to north of Culiacan ($24^{\circ} 48' N.$). The isotherm of 20° has its greatest elevations on the Atlantic side at Mirador, Vera Cruz, 1,000 meters, and at about 700 meters in Nuevo Leon, while on the Pacific side it reaches 1,560 meters at Oaxaca, and as much in Sonora. (Compare Magdalena.) Deprest portions of the central plateau have a higher mean annual temperature than less elevated points in nearly the same latitude on the Atlantic slope. (Compare Lerdo and Monterey.)

These remarks are suggested by the assertion by a recent zoological writer (Gadow, *Proceedings Zoological Society of London*, 1905, II, p. 196) of the existence of a much cooler climate on the Pacific side than on the Atlantic side of Mexico at almost the same elevation.

Records of mean monthly temperatures for a considerable number of other Mexican localities exist in literature (e. g. MWR 1896-1906; BOM 1888, 1889, 1895-1902, 1904; *Anales, Ministerio de Fomento Repub. Mex.* I, p. 649 et seq., IX, p. 329 et seq.; Barcena and Perez, *Estudios de Meteorologia Comparada, Mexico*, 1885, etc.), but these monthly records are not sufficiently numerous or continuous to permit of calculations of the mean annual temperatures of their respective stations.

A SMALL CLOUDBURST NEAR SHASTA, CALIFORNIA.

By R. H. McCANDLESS. Dated Calpella, Cal., February 10, 1908.

The article on "Cloudbursts," by Mr. Edward L. Wells, Section Director, Boise, Idaho, published in the Yearbook for 1906, suggests that the ruggedness of the country has to do with these special phenomena, which certainly are not tornadoes or waterspouts, properly so-called. In this connection I would state that during the winter of 1890 I lived in the town of Shasta, Cal., and put in much of the time prospecting in the vicinity. On one of these trips I came upon the opening of a steep and narrow, rocky ravine, down which had recently poured a tremendous flood of water. Ascending this ravine, I noticed that the leaves and bushes on its sides were covered with mud and grass roots, showing that the water must have had a depth of at least 30 feet as it came down the gulch.

At the upper end of the ravine, or gulch as it would be called by the local miners, and just below the crest of the ridge, I found a place approximately 50 feet square, where all the soil and loose stones were completely washed away, together with the bushes and one pine tree nearly two feet in diameter, just as would have been done by turning a huge stream of water upon it under heavy pressure. The pine had been carried some distance down the gulch.

Standing upon the spot and carefully regarding all the evidence in sight, I could form no other conclusion but that here, within the past few days, had fallen a veritable river from the clouds, leaving nothing where it fell except the hard bed rock.

I saw many similar denuded spots in the vicinity, but none of so recent a date as to leave any positive evidence of the manner of denudation.

All of these denuded spots occurred within two miles of the town of Shasta and on the eastern side of the low range of hills surrounding it on the west, northwest, and southwest.

LOCAL CHANGES OF CLIMATE.

By W. C. DEVEREAUX, Local Forecaster. Dated Milwaukee, Wis., February 12, 1908.

I was much interested in the short editorial on "Changes in climate" which appeared in the Wisconsin Agriculturist, of January 30, 1908. As this is a most interesting subject I have carefully examined the records of this office with a view of

discovering what changes, if any, have occurred in the climate of Wisconsin, and especially in this part of the State.

The statement is frequently made that the winters in this vicinity are gradually becoming milder and that the snowfall is decreasing. Just about a year ago the temperature fell to 50° below zero at two places in the northern part of the State, and this low reading has not been surpassed by any known record in Wisconsin. On the 28th of the following April there was a heavy snowfall over the northern part of the State, while at Milwaukee on January 28 of the present year, 16.0 inches of snow fell in twenty-four hours, which is the heaviest fall that has occurred since the records began in 1885; and the total fall for January, 1908, was 29.0 inches, which is the third largest fall on record for that month.

The precipitation record at Milwaukee for the past thirty-seven years shows that over 50 inches fell in 1876, while there were only 18 inches in 1901. This might lead one to hastily conclude that the rainfall is decreasing very rapidly, but there appears to be no great cause for alarm, for the precipitation since 1901 has varied only 1 per cent from the average for the thirty-seven years.

The temperature record since 1870 shows no appreciable change in the climate at this place, the mean temperature for 1907 being only 0.3° above the normal. The highest temperature at this station was 100° on July 16, 1887, and again on July 20, 1901, while the coldest days were January 9, 1875, with 25° below zero; January 5, 1884, with 24° below; February 9, 1899, with 22° below, and January 25, 1904, with 23° below. These extremes in temperature are well distributed thruout the period covered by the records.

In reference to the prevailing idea that the rainfall is increasing in the arid country, I have carefully examined the records of several hundred stations in the arid and semiarid regions along the eastern slope of the Rocky Mountains, and find that the precipitation for 1907 was not only decidedly less than the average for the four preceding years, but was about 10 per cent below the average for the last twenty or thirty years. From this it would hardly be safe to infer that the rainfall is decreasing in that region, neither is it correct to conclude that the rainfall is increasing after a few comparatively wet years.

As one of the newspapers in this city well said in a recent issue—

The seasons are likely to succeed each other for a longer time in the future than any one alive is likely to survive. There will be seed time and harvest. There will be blustering Marches and showery Aprils, and balmy Junes, and torrid Julys and Augusts. There will be pleasant autumns and bleak Decembers, and there will be winter cold as well as summer heat—just as there was in the olden times * * *. In those olden times, as now, there were open winters now and then, and cool summers now and then. But they were exceptional. The general run of weather in this latitude can be depended upon * * *. The open winter of the present year has been open enough to let in plenty of cold wind from the north and northwest to insure the success of the ice crop.

The United States Weather Bureau is interested in making an authentic record of the climatic conditions of the country and in distinguishing between an apparent change in the climate and the variability of the weather. If an appreciable climatic change should be discovered, Prof. Willis L. Moore, Chief of the Weather Bureau, would be prompt in publishing the fact, but as he stated¹ before the Committee on Agriculture of the House of Representatives, at Washington, D. C.:

It is my duty to publish the simple, ungarnished facts in regard to the climatic conditions of the United States. Our people want the truth so that they may not be misled either by those who honestly, but nevertheless ignorantly, claim that hot winds and droughts will never again come, or by those who, when periods of deficient rainfall occur, as they have in the past and as they certainly will in the future, preach discouragement and the abandoning of lands which, on the average of a long period of years, it would be profitable to cultivate.

¹ See Monthly Weather Review January, 1907, Vol. XXXV, p. 13.